

SysML Distilled™ Workshop

– MagicDraw™ edition

Accelerate your SysML project with this intense, interactive workshop that emphasizes pragmatic principles and techniques, and shows how to apply them with MagicDraw™, an award winning modeling tool.

The Systems Modeling Language (**SysML**) is a **general-purpose modeling language for systems engineers** that has been adopted by the Object Management Group as **OMG SysML™**. SysML offers many advantages over the Unified Modeling Language (UML) for systems engineers who are specifying complex systems, including the following:

- **SysML semantics (interpretations of notation) are better suited for systems engineering.** SysML reduces UML's software-centric restrictions and adds two new diagram types for requirements engineering and performance analysis: Requirement diagrams and Parametric diagrams, respectively.
- **SysML notation is simpler, and easier to learn and apply.** Since SysML removes many software-centric and gratuitous constructs, the overall language is smaller as measured in diagram types (nine vs. thirteen) and total constructs. Consequently, it is easier to learn and apply.
- **SysML allocation tables support various kinds of allocations.** SysML allocation tables support requirement allocation, functional allocation, and structural allocation, thereby facilitating automated verification and validation (V&V) and gap analysis.
- **SysML model management constructs support the specification of models, views, and viewpoints.** These high level modeling abstractions are architecturally aligned with IEEE-Std-1471-2000 (IEEE Recommended Practice for Architectural Description of Software-Intensive Systems), and can be used for specifying DoDAF/MODAF views and viewpoints.

THE PIVOTPOINT TRAINING ADVANTAGE

- **Authored and taught by experts.** All workshops are authored by PivotPoint's founder, Cris Kobryn, an internationally recognized expert in visual modeling languages and model-driven development technologies. (Cris chaired the international standardization teams for UML 1.1, UML 2.0 and SysML 1.0.) In addition, all PivotPoint instructors have 10+ years experience working with Model-Driven Development technologies.
- **Small, intense and interactive.** We limit workshop sizes, usually to a maximum of 12 students. This ensures that students get the individual attention that they need to learn quickly. Also, our workshops are intense and highly interactive with frequent work sessions, so you will learn from other students as well as your instructor.
- **Proven principles and best practices.** Our workshops emphasize proven modeling principles and best practices that will work with all modeling tools that comply with the relevant standards. If you have already chosen a modeling tool, we can integrate optional tool training in your workshop. If you have not yet selected a modeling tool, we can help you select one that best meets your project and team needs.
- **Emphasis on pragmatic problem solving.** Our workshops emphasize the use of modeling technologies to solve tough, practical problems such as those you encounter on your day job. The bigger and more difficult the problem you choose for practice sessions, the more interesting the workshop will be for the students and the instructor.
- **Flexible choice of venue.** Our workshops are available onsite at Client training facilities, which allow us to customize workshops to meet Client project or team needs, or at PivotPoint training facilities.

WHAT WILL YOU LEARN?

The following are the key learning objectives of this workshop:

- What is SysML and why do we model systems?
- SysML's basic and advanced constructs for modeling requirements, structure and behavior
- How SysML can model large, complex systems
- How SysML can specify the full system engineering lifecycle: requirements through testing
- Practical guidelines for specifying correct, clear, concise and consistent models
- How to verify and validate a SysML model
- How you can customize SysML for specific domains, such as aerospace-defense, telecom and manufacturing
- How SysML can be used with object, component-based and structured analysis/design methods
- How to select SysML tools and methods
- How to draw and execute SysML using a selected SysML tool: MagicDraw
- How to learn more about SysML modeling

WHO SHOULD PARTICIPATE?

System engineers, system architects, software architects/engineers, project managers, and others who want to learn how the SysML can improve how they architect, analyze, design, and manage complex systems will benefit from this workshop.

PREREQUISITES

Systems or software engineering experience in building large, complex systems. Experience using one or more structured analysis/design, object or component methods is desirable.

WORKSHOP AUTHOR & PRIMARY INSTRUCTOR



Cris Kobryn is the CEO and Founder of PivotPoint Technology Corporation, a company that specializes in Model-Driven Engineering Solutions™ for tough business and engineering problems. He is an internationally recognized expert in visual modeling and model-driven development, and has successfully applied these technologies to diverse industries ranging from aerospace-defense and telecom to financial services and manufacturing. Cris has global experience leading high-performance software development teams, and has architected custom applications and commercial products. He formerly held senior technical positions at Telelogic, EDS, MCI Systemhouse, Inference Corporation, and SAIC.

Cris chaired large international teams of vendors and users to specify the Unified Modeling Language (UML) 1.1 and 2.0 standards for software engineering, and the Systems Modeling Language (SysML) for systems engineering. In recognition of Cris's contributions to the UML the Object Management Group (OMG) presented him with its Distinguished Service Award, and in acknowledgement of his contributions to the SysML the International Council on Systems Engineering (INCOSE) presented him with its Outstanding Service Award. Cris is a contributing editor for *Software and Systems Modeling* journal, and a member of IEEE, INCOSE, ACM, and AAI.

WORKSHOP SYLLABUS

The workshop syllabus, in a menu form that can be customized to meet your needs, is described at the end of this handout. NOTE: This workshop description and syllabus are subject to revision. Check www.PTCorp.com/training.htm for updates.

WORKSHOP SIZE

The number of workshop participants is restricted to maximize interactions with the instructor, especially during modeling lab sessions. Most workshops are restricted to 12 or fewer participants. Exceptions must be approved by the instructor.

COST, AVAILABILITY, AND FURTHER INFORMATION

This workshop is available at client sites, PivotPoint instructional facilities, or by web conferencing. Costs depend upon your choice of venue, duration, and the number of participants. For further information regarding the contents, availability, and cost of the workshop please email workshops@PTCorp.com or call +1-760-728-9747.

WORKSHOP MENU

All PivotPoint workshops include both structured presentations and interactive hands-on work sessions to reinforce learning principles and best practices. In addition, workshops can be customized for different project and team requirements.

- **3 day workshop** includes: *SysML – Basic, SysML – Intermediate, and SysML – Basic Modeling Tool.*
- **4 day workshop** includes: *SysML – Basic, SysML – Intermediate, SysML – Basic Modeling Tool, and either SysML –Advanced OR SysML – Project Practicum.*
- **5 day workshop** includes: *SysML – Basic, SysML – Intermediate, SysML –Advanced, SysML – Basic Modeling Tool, and SysML – Project Practicum.*

<p style="text-align: center;">SYSML – BASIC [Module# LS101]</p> <p>Introduction</p> <ul style="list-style-type: none"> • Model-Driven Engineering • Basic Concepts • Principles and best practices <p>SysML Quick Tour</p> <ul style="list-style-type: none"> • Language overview • Diagram walkthrough <p>Diagram Techniques</p> <ul style="list-style-type: none"> • Use Case diagrams • Requirement diagrams • Activity diagrams • Block Definition diagrams <p>Lifecycle Phases</p> <ul style="list-style-type: none"> • Requirements • Analysis 	<p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Understand the advantages of a Model-Based Systems Engineering approach • Comprehend the differences among architectural models, frameworks, processes, and tools • Understand the similarities and differences between SysML and UML • Learn the basic concepts and principles for modeling complex systems with SysML • Understand how to specify a correct, complete, concise, and consistent model
<p style="text-align: center;">SYSML - INTERMEDIATE [Module# LS102]</p> <p>Topics</p> <ul style="list-style-type: none"> • Architecture description languages, patterns and frameworks • Interface-based design and Service-Oriented Architectures (SOA) • Verification & Validation (V&V) techniques <p>Diagram Techniques</p> <ul style="list-style-type: none"> • Internal Block diagrams • Sequence diagrams • State Machine diagrams • Parametric diagrams • Package diagrams • Allocations <p>Lifecycle Phases</p> <ul style="list-style-type: none"> • Design • Construction • Testing 	<p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Understand how to use SysML as an architecture description language • Learn how to make your models more scalable • Understand how to improve the integrity and quality of your models • Learn how to apply SysML modeling techniques to the full system development life cycle • Understand how to verify and validate your models

<p style="text-align: center;">SysML – ADVANCED [Module# LS103]</p> <p>SysML Review <i>[If SysML refresher required]</i></p> <p>Topics</p> <ul style="list-style-type: none"> • Advanced structural modeling • Advanced behavioral modeling • Design patterns • Customizing UML for domains and platforms • Executable models • Process selection and customization • Tool selection and customization 	<p>Goals</p> <ul style="list-style-type: none"> • Learn advanced SysML modeling techniques to refine structural and behavioral models • Understand how to customize SysML for your work domain and target platform • Learn how to build executable models, which can drive simulations and generate code • Understand how to select model-driven processes and tools
<p style="text-align: center;">SysML – BASIC MODELING TOOL: MAGICDRAW™ [Module# LS111-EA]</p> <p>Topics</p> <ul style="list-style-type: none"> • Projects and diagrams • Generating documentation • Roundtrip engineering • Importing/exporting models • Model validation and metrics <p>Diagram Techniques</p> <ul style="list-style-type: none"> • Requirement diagrams • Activity diagrams • Block Definition diagrams • Internal Block diagrams • Parametric diagrams • Sequence diagrams • State Machine diagrams • Package diagrams • Use Case diagrams • Allocation tables 	<p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Gain familiarity with the user interface and basic features of selected SysML modeling tool • Learn how to model most common SysML diagram types using selected tool • Understand the strengths and weaknesses of selected tool • Assess SysML and XMI standards compliance for selected tool
<p style="text-align: center;">SysML – PROJECT PRACTICUM [Workshop# LS121]</p> <p>The project practicum provides an opportunity to apply SysML modeling principles and best practices to solve project modeling problems in a creative and supervised workshop environment. The practicum can be used to facilitate:</p> <ul style="list-style-type: none"> • SysML model peer reviews • SysML model revisions and extreme makeovers <p>Students can identify project modeling problems in advance, or Instructor will work with students to identify them.</p>	<p style="text-align: center;">Goals</p> <ul style="list-style-type: none"> • Identify the SysML modeling principles and best practices that are most important to your team and your project • Apply advanced SysML modeling techniques to project problems that you choose